Philodendron

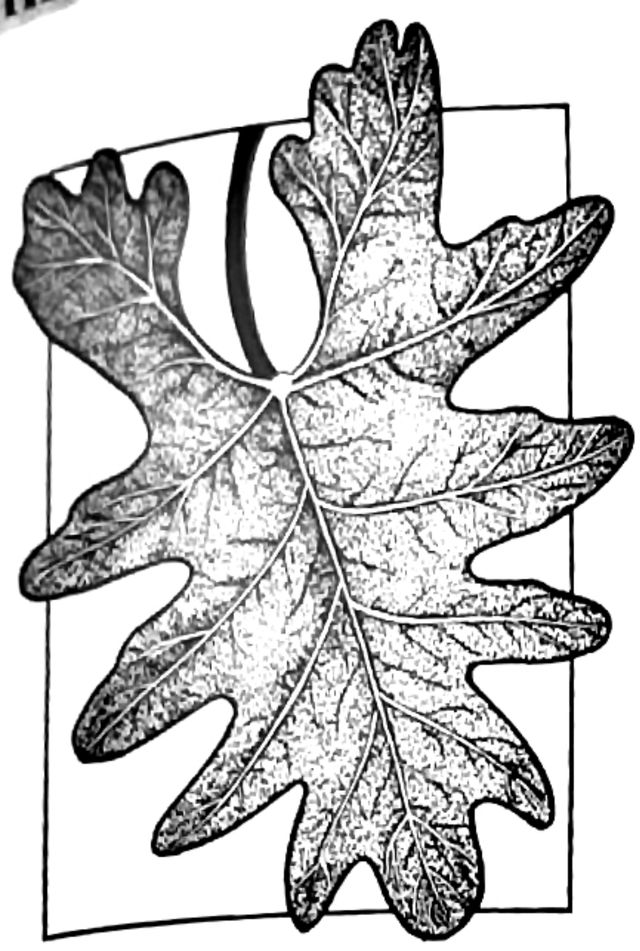

FIGURE II-1 PHILODENDRON Potted *Philodendron scandens oxycardium* being grown on a totem pole.

INTRODUCTION

Common and scientific names: Vining philodendrons: (1) *Philodendron scandens oxycardium* C. Koch & Sello (formerly known as *P. oxycardium* or *P. cordatum*), heart-leaf philodendron, parlor ivy, or common philodendron; (2) *P. erubescens* K. Koch. & Augustin., red-leaf philodendron, or blushing philodendron; and (3) *P. cordatum* (Vell. Conc.) Kunth., heart-leaf philodendron (Huxley et al., 1992). Self-heading philodendrons include (1) *P. cannifolium,* Kunth. and (2) *P. wendlandii* Schott. (Huxley et al., 1992). Erect-arborescent philodendrons include *P. bipinnatifidum* Endl. (formerly known as *P. selloum*), horse-head philodendron, fiddle-leaf philodendron, or lacy-tree philodendron, which appears self-heading when young but becomes more erect and woody when mature (Griffiths, 1998). Numerous other species and hybrids are grown.

Family and related taxa: Araceae Juss. This plant family has contributed a number of important foliage plant species to the industry including *Aglaonema, Anthurium, Caladium, Dieffenbachia, Epipremnum, Monstera, Nephthytis, Spathiphyllum, Syngonium,* and *Zantedeschia.* Another aroid, the calla lily (*Zantedeschia*), is also an important cut flower and potted flowering plant.

Origin: Philodendrons are native to the tropical regions of Central and South America, but have been naturalized in tropical regions of many parts of the world (Bailey and Bailey, 1976).

Uses and current status: Philodendrons are popular foliage plants due to their glossy green foliage, adaptability to the indoor environment, and ease of production. Several cultivars also have reddish leaves and stems or yellow foliage.

P. scandens oxycardium is probably one of the most tolerant foliage plants for low light and low humidity in the interior (Fig. II-1 Philodendron). Vining philodendrons are usually grown in hanging baskets but can also be grown on totems or in small pots for direct sale or for incorporation into container gardens. Self-heading or erect-arborescent philodendrons are sold as potted plants in pot sizes ranging from 3 in. (7.5 cm) to 17 in. (43 cm). Philodendrons can also be used as landscape ornamentals in warm regions.

CULTIVARS

Philodendrons can be divided into three types: vining philodendrons, of which *P. scandens oxycardium* is the most commonly grown; self-headed philodendrons, which have short internodes and form self-supporting plants; and erect-arborescent philodendrons, which appear self-heading when young but become more erect and woody when mature. In the low light of the interior environment, the stems of some self-headed philodendrons may elongate and become more vinelike. Numerous cultivars and hybrids of self-headed and erect-arborescent types are available.

PROPAGATION

Vining philodendrons are propagated by tip, single-eye, or double-eye cuttings taken from stock plants or from the prunings of previous crops (McConnell et al., 1981). Cuttings root best under 3000 fc (600 $\mu mol \cdot m^{-2} \cdot s^{-1}$) light at 80°F (27°C) (Henney et al., 1991). Little or no

mist is used and tent propagation works well (Griffith, 1998). Rooting hormone is not required. Although cuttings are typically propagated directly into the final container, they can also be rooted in plugs for later planting or for incorporation into container gardens. Optimum light level for stock plants is 3000 fc (600 $\mu mol \cdot m^{-2} \cdot s^{-1}$).

Self-headed and erect-arborescent philodendron species are typically propagated by seed and hybrids by tissue culture. Cutting propagation is impractical due to the large leaves and short internodes. Tissue-cultured philodendrons are especially desirous because they have numerous basal branches, which produce compact plants, while seed- or cutting-propagated plants are poorly branched. Tissue-cultured plants can be purchased as nonestablished microcuttings or as rooted plugs. The microcuttings require rooting, while the plugs are established and are much easier to use.

Philodendron seeds are tiny and best germinated at 75 to 80°F (24 to 27°C) on a media with a low EC (Henley et al., 1991). Germination can be done in the propagation house or in germination rooms. Light levels of 300 to 600 fc (60 to 120 $\mu mol \cdot m^{-2} \cdot s^{-1}$) are used during germination and 1500 to 2500 fc (300 to 500 $\mu mol \cdot m^{-2} \cdot s^{-1}$) after the seedlings have developed two leaves. As with tissue-cultured plants, many producers buy plugs and avoid the problems with seed propagation.

FLOWERING CONTROL AND DORMANCY

Because plants are grown for their foliage, flowering is not encouraged and typically occurs only on older plants growing outdoors in tropical areas.

TEMPERATURE

Philodendrons are tolerant of a wide range of temperatures but optimum growth takes place between 70 and 85°F (21 and 29°C) (Henley et al., 1991). The media temperature must be at least 65°F (18°C) and air temperature 75°F (24°C) for optimum growth. With proper water and light levels, air temperatures of 105°F (41°C) are not damaging to *P. scandens oxycardium*. Nowak and Rudnicki (1990) recommended reducing the temperature when plants are shaded during production. *P. bipinnatifidum* is tolerant of cold in the landscape and can survive below freezing temperatures (Griffith, 1998).

LIGHT

Heart-leaf and hybrid philodendrons grow best at 1500 to 2500 fc (300 to 500 $\mu mol \cdot m^{-2} \cdot s^{-1}$), with the optimum light level being 2000 fc (400 $\mu mol \cdot m^{-2} \cdot s^{-1}$) for *P. scandens oxycardium* (Henley et al., 1991; Henny et al., 1991). *P. bipinnatifidum* and other species of philodendrons can be grown in full sun outdoors in Florida; the most attractive foliage is obtained at 3000 to 5000 fc (600 to 1000 $\mu mol \cdot m^{-2} \cdot s^{-1}$).

WATER

Although philodendrons are tolerant of drying out, the media should remain moist for best growth.

CARBON DIOXIDE

No data available.

NUTRITION

Constant liquid fertilization rates of 200 ppm N and controlled-release or granular fertilizers at 0.56 oz/ft²/year (170 $g \cdot m^{-2} \cdot year^{-1}$) N can be used (Griffith, 1998; Henny et al., 1991). For both types of fertilization a 3:1:2 N:P:K ratio fertilizer should be used (Table II-1 Philodendron). Marginal necrosis of older foliage can occur with magnesium deficiency. Extra magnesium should be included in the fertilizer program. Calcium deficiency in *P. scandens*

TABLE II-1 PHILODENDRON

Recommended fertilizer rates for *Philodendron* species and their cultivars (Conover and [illegible] 1990).

	Controlled Release 19-6-12 g/3 Months/Pot [in. (cm)]					
Species	*4 (10)*	*6 (15)*	*8 (20)*	*10 (25)*	[illegible]	*14 (35)*
P. scandens oxycardium	1.8	4.0	7.2	11.2	16.2	21.8
P. bipinnatifidum	2.2	4.8	8.6	13.5	19.4	26.2
Other *Philodendron* species and hybrids	1.8	4.0	7.2	11.2	16.2	21.8

oxycardium produced death of the root tips, chlorotic spots on young foliage, and distortion of expanding leaves (Hershey and Merritt, 1987). Calcium foliar sprays may be useful (Griffith, 1998). Foliar nutrient levels for high-quality plants are listed in Chapter 6, Nutrition, Table 6-4.

MEDIA

Philodendron media should be well drained with a pH of 5.5 to 6.0 (Griffith, 1998). If the cuttings are propagated directly into the final pots, the media must be particularly well aerated, yet retain enough moisture to prevent excessive watering when plants are ready to market.

HEIGHT CONTROL

Height control is generally not needed on philodendrons; however, the length of the vines has been controlled with growth retardants. Results are often mixed but the following chemicals and rates have been used with varying degrees of success: B-Nine (daminozide) (10,000-ppm spray), Cycocel (chlormequat) (3000-ppm spray), and A-Rest (ancymidol) [50- to 100-ppm spray or 0.25 to 1.0 mg a.i. drench per 6-in. (15-cm) pot] (Henny, 2001). Adriansen (1985) noted that Cycocel and B-Nine are effective on *P. erubescens* and A-Rest is effective on *P. scandens oxycardium*.

SPACING

Pots and baskets are spaced pot-to-pot until the foliage touches and the stems begin to vine. Hanging baskets should be either trimmed or spaced out to prevent shoots from becoming tangled. Final spacing on self-headed philodendrons will depend on pot size.

PINCHING AND DISBUDDING

Vine philodendron plants are often shaped one or two times before sale by trimming the longest shoots. The shoots can then be used to propagate the next cycle of plants. The trimmed shoots produce multiple axillary shoots, which make the plants fuller. Self-headed and erect-arborescent philodendrons generally do not require pinching.

SUPPORT

Vines can be attached mechanically or by natural root growth to totem poles for upright growth. Self-headed philodendrons generally do not need support.

SCHEDULE AND TIMING

Cuttings usually require 3 to 4 weeks for rooting at 80°F (27°C). Production of a hanging basket can take an additional 10 to 12 weeks at night temperatures of 75°F (24°C) and day temperatures of 85°F (29°C). Large-size potted specimens can take many months from propagation to finish.

INSECTS

Several insects and related pests can infest the greenhouse including aphids, mealybugs, scale, thrips, fungus gnats, and shoreflies. Mealybugs and scale can become particularly troublesome under long-term production such as with stock plants or conservatory collections. Caterpillars can also be a problem in warm climates such as Florida, Texas, and California. Because caterpillars can cause much damage in a short time, frequent checks are required to find and control outbreaks before major damage occurs.

DISEASES

Philodendrons are subject to several common foliage plant diseases including bacterial leaf spot (*Xanthomonas camperstris* pv. *dieffenbachiae, Pseudomonas cichorii, Erwinia carotovora,* and *E. chrysanthemi*), cutting soft rot (*Erwinia carotovora* and *E. chrysanthemi*), and root rot (*Pythium splendens, Phytophthora,* and *Rhizoctonia solani*) (Chase, 1987; Horst, 1990; Henley et al., 1991; Henny et al., 1991). Free moisture on leaves and wounding increases disease severity of *Erwinia chrysanthemi* on *Philodendron bipinnatifidum* (Haygood and Strider, 1981). Once *Erwinia chrysanthemi* becomes established in a production area, the pathogen can remain in fallen leaves and rooting medium and on symptomless leaves and seeds for at least 11 months (Haygood et al., 1982a). Interestingly, increased N applications reduced the severity of *Erwinia chrysanthemi* on *P. bipinnatifidum,* but the effective N levels also reduced plant growth (Haygood et al., 1982b).

Other reported diseases include fungal leaf spot (*Cercospora, Colletotrichum, Dactylaria humicola, Myrothecium roridum, Phyllosticta,* and *Phytophthora parasitica*), anthracnose (*Gloeosporium*), and gray mold (*Botrytis cinerea*) (Horst, 1990). Of these, *Dactylaria humicola* and *Phytophthora parasitica* are particularly common (Griffith, 1998). The striking white mycelia of southern blight

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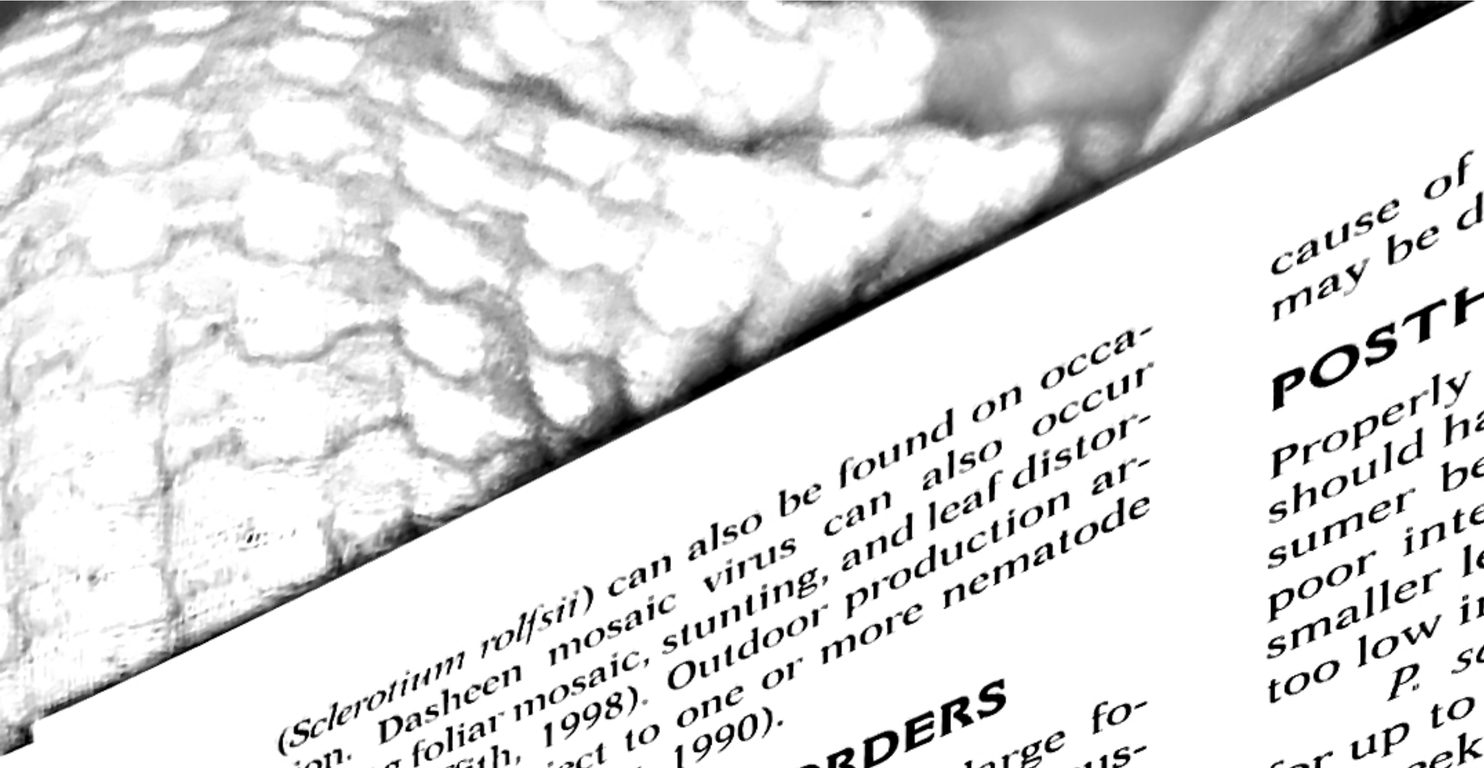

(*Sclerotium rolfsii*) can also be found on occasion. Dasheen mosaic virus can also occur causing foliar mosaic, stunting, and leaf distortions (Griffith, 1998). Outdoor production areas may be subject to one or more nematode species as well (Horst, 1990).

PHYSIOLOGICAL DISORDERS

High fertilizer rates can also cause large foliage; rapid, weak growth; and increased susceptibility to root rot if the medium EC is equally high. Light that is too intense during production can cause foliage to bleach and become pale green. Conversely, light that is not intense enough can cause slow growth, poor rooting of cuttings, and excessive stretching of stems and petioles. Low nutrition and low temperatures can also cause light-green foliage color. *P. scandens oxycardium* is subject to two types of foliar chlorosis according to Henny et al. (1991): (1) Chlorosis appears on the outer lobe margins near the petiole attachment and is due to magnesium deficiency. (2) Chlorosis appears on the lower margins opposite the petiole with some streaks extending upward and occasionally margin chlorosis. The cause of this latter sy... may be due to a micronutri...

POSTHARVEST

Properly acclimated philodendron plants should have a long postharvest life for the consumer because philodendrons are tolerant of poor interior conditions. Plants will produce smaller leaves if the light or fertility levels are too low in the consumer's environment. *P. scandens oxycardium* can be shipped for up to 2 weeks and *P. bipinnatifidum* for up to 4 weeks at 55 to 61°F (13 to 16°C) with no decrease in quality (Conover, 1991). *P. scandens oxycardium* plants tolerated up to 24 days in the dark at 72°F (22°C), but some of the young leaves failed to expand (Biran and Kofranek, 1981). The optimum temperature for long-term storage of *P. erubescens* was 57°F (14°C) (Tijskens et al., 1996). Philodendrons are sensitive to external ethylene concentrations, with leaf abscission occurring after exposure to 5 ppm ethylene for 3 days (L. Høyer, personal communication; Marousky and Harbaugh, 1978; Nowak and Rudnicki, 1990).

KEY POINTS

- Philodendron is used as a potted foliage plant, grown with or without a totem, and a hanging basket plant.
- Numerous species, cultivars, and hybrids are grown and can be separated into three groups: vining, self-heading, and erect-arborescent.
- The most popular vining type is *Philodendron scandens oxycardium*.
- Plants are propagated by tip, single-eye, or double-eye cuttings seed, or *in vitro*.
- Vining plants are usually trimmed, shaped, and allowed to regrow before marketing; trimmed shoots are often used for propagation.
- Optimum light intensity is 1500 to 2500 fc (300 to 500 μmol · m^{-2} · s^{-1}) for most species.
- Plants are susceptible to numerous diseases, especially bacterial leaf spot, cutting soft rot, and root rot.
- Properly acclimated plants should have a long postharvest life for the consumer.

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